Remarks

Applicants respectfully request reconsideration of the present application in view of the above amendments and following remarks. Claims 1, 11, 12 and 16 have been amended and claims 13-15 have been cancelled. No claims have been added. Therefore, claims 1-3, 6, 9-12 and 16-18 are pending in the present application.

Claims 1-3, 6 and 9-18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Reference No. JP2001-41012 to Ichinose ("the Ichinose reference") in view of U.S. Patent No. 6,516,763 to Strauss ("the Strauss reference"). Claims 13-15 have been cancelled, therefore the rejection of these claims is moot. Applicants respectfully traverse the remaining rejections.

Amended claim 1 is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser having a rear cover plate and a front cover plate secured to the stator and enclosing the rotor within the stator. The phaser includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism includes a straight-sided locking pin, a well, means for directing phase-advance oil to the pin for urging the pin from the well, and means for directing phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-advance oil includes a first channel connecting the well to a supply of the phase-advance oil. Further, the means for directing the phase-retard

oil includes a second channel connecting the well to a supply of the phase-retard oil. Moreover, the cross-sectional area of the first and second channels are different.

"It is well-established that before a conclusion of obviousness may be made based upon a combination of references, there must have been a reason, suggestion or motivation to lead an inventor to combine those references." *Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc.*, 37 USPQ.2d 1626 (Fed. Cir. 1996). The fact that a prior art reference could be modified so as to produce the claimed invention is not a basis for an obviousness rejection." *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). The need or desire to modify the reference must be more than merely apparent. The showing must be both clear and particular. *See Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 665 (Fed. Cir. 2000) (*citing In re Dembiczak*, 53 USPQ.2d 1769 (Fed. Cir. 2000)).

In rejecting claim 1, the Examiner stated that the Strauss reference discloses the locking pin (13) as a straight-sided pin. *See Office Action*, pg. 4. However, Applicants submit that there is no motivation or suggestion to modify the locking pin (230) in the Ichinose reference with the straight sided locking pin as taught in the Strauss reference. The locking pin device (230) shown in FIG. 6 of the Ichinose reference appears to operate much the same as the prior art devices, wherein oil pressure acts on a shoulder formed on the pin to move the pin to an unlocked or retracted position. *See Specification*, pg. 2, lines 16-28; pg. 2, lines 1-2. In order for the locking pin to operate in the Ichinose reference, it must have a shoulder. That is, with a straight-sided locking pin, the mechanism disclosed in the Ichinose reference would be inoperative.

Specifically, in the Ichinose reference, oil appears to be supplied from the advance and retard chambers (121, 123) through the upper channels (233, 235) to supply a lift force on the shoulder portion of the pin (230) to counteract the bias of the spring (237) and move the pin (230) from the fully extended position shown in FIG. 6. Without the shoulder on the pin (230), the oil would not have a surface to supply the lift force necessary to move the pin (230) from its extended position. In particular, the oil entering the upper channels (233, 235) would not have a surface to impose a lift force since the shoulder would not be present. Further, in the fully extended position, the front face of the pin (230) is engaged with the surface of the well (231) thereby blocking off the path of oil from the passages (237, 239) to the front face of the pin (230). Therefore, if the straight sided locking pin from the Strauss reference is used in place of the pin (230) in the Ichinose reference, the oil entering the well (231) through lower passages (237, 239) would not be able to impose a lift force on the front face of the pin (230) to unlock the pin (230). Thus, eliminating the shoulder on the pin (230) would effectively render the device disclosed in the Ichinose reference inoperable for its intended purpose. *See Gordon*, 733 F.2d at 902 (finding no suggestion to modify a prior art device where the modification would render the device inoperable for its intended purpose). For at least this reason, Applicants request that the rejection of claim 1 be withdrawn.

Even if the Ichinose reference and the Strauss reference are properly combinable, which Applicants believe to be incorrect, Applicants submit that none of the references taken alone of in combination teach or suggest a locking pin mechanism wherein the cross-sectional area of the first and second channels are

different as recited in amended claim 1. In the Office Action, the Examiner stated that it would have been an obvious matter of design choice to assign different dimensions to the first and second channels depending upon the phaser requirements for a given engine. *See Office Action*, pg. 4. However, the Examiner has failed to point out anything in the Ichinose reference or the Strauss reference that suggests making the cross-sectional area of the first and second channels different. By varying the cross-sectional area of the first and second channels, the locking pin mechanism of the present invention may provide the desired unlocking forces to the locking pin to move it to an unlocked or retracted position. *See Specification*, pg. 7, lines 4-6. The prior art fails to teach or suggest the use of first and second channels to retract a straight-sided-pin from a well, therefore the Examiner appears to have used hindsight reconstruction to reject claim 1. Applicants request that the rejection to claim 1 be withdrawn. As claims 2, 3, 6, 9 and 10 depend from claim 1, these claims are also not taught or suggested by the references of record for at least the same reasons set forth above with respect to claim 1.

Amended claim 11 is directed to is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser having a rear cover plate and a front cover plate secured to the stator and enclosing the rotor within the stator. The phaser includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism includes a straight-sided locking pin, a well, and means for directing at least one of the phase-advance oil and the

phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-retard oil includes a channel connecting the well to a supply of the phase-retard oil.

For at least the same reason set forth above with respect to claim 1, Applicants submit that the pin (23) in the Ichinose reference may not be replaced with the straight-sided locking pin (13) disclosed in the Strauss reference without rendering the locking device disclosed in the Ichinose reference inoperable for its intended purpose. *See Gordon*, 733 F.2d at 902. As such, Applicants submit that claim 11 is not taught or suggested by the references of record.

Amended claim 12 is directed to an internal combustion engine including a vane-type camshaft phaser comprising a locking pin mechanism for variably locking together a rotor and a stator. The phaser has a rear cover plate and a front cover plate secured to the stator for enclosing the rotor within the stator. The phaser also includes means for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and the stator. The locking pin mechanism includes a straight-sided locking pin, a well, means for directing the phase-advance oil to the pin for urging the pin from the well, and means for directing the phase-retard oil to the pin for urging the pin from the well. The locking pin is disposed in an axial bore in the rotor. The well is formed in the front cover plate for receiving a portion of the locking pin in locking mode. The means for directing the phase-advance oil includes a first channel connecting the well to a supply of the

phase-advance oil. The means for directing the phase-retard oil includes a second channel connecting the well to a supply of the phase-retard oil. Further, the cross-sectional area of the first and second channels are different.

For at least the same reasons set forth with respect to claim 1, the combination of the Ichinose reference and the Strauss reference does not teach or suggest all of the limitations included in amended claim 12. Therefore, Applicants request that the rejection of claim 12 be withdrawn.

Amended claim 16 is directed to a locking pin mechanism for variably locking together a rotor and a stator in a vane-type camshaft phaser. The vane-type camshaft phaser has a rear cover plate and a front cover plate secured to the stator and encloses the rotor within the stator. The phaser also includes at least one passage for supplying phase-advance oil and phase-retard oil to respective advance and retard chambers formed between the rotor and stator. The locking pin mechanism comprises a shoulderless locking pin, a well, and first and second channels. The locking pin is disposed in an axial bore in the rotor. The well is formed in one of the rear cover plate and the front cover plate for receiving a portion of the locking pin in locking mode. The first channel is for directing the phase-advance oil to the pin for urging the pin from the well. The first channel also connects the well to a supply of the phase-advance oil. The second channel is for directing the phase-retard oil to the pin for urging the pin from the well. Further, the second channel connects the well to a supply of the phase-retard oil. The cross-sectional area of the first and second channels are different.

For generally the same reasons set forth above, the combination of the Ichinose reference and the Strauss reference does not teach or suggest all of the limitations included in amended claim 12. In particular, the combination of the Ichinose reference and the Strauss reference does not teach or suggest a locking pin mechanism including a shoulderless pin, wherein the cross-sectional area of the first and second channels are different as recited in claim 16. Applicants request that the rejection of claim 16 be withdrawn. As claims 17 and 18 depend from claim 16, these claims are also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 16.

Conclusion

In light of the foregoing, Applicants submit that claims 1-3, 6, 9-12 and 16-18 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicants do not believe that any fee is due at this time. However, the Commissioner is authorized to charge any fee that may have been overlooked to Deposit Account No. 10-0223.

Respectfully submitted,

Dated: 3-23-05

Ronald J. Kisicki
Reg. No. 38,205

For generally the same reasons set forth above, the combination of the Ichinose reference and the Strauss reference does not teach or suggest all of the limitations included in amended claim 12. In particular, the combination of the Ichinose reference and the Strauss reference does not teach or suggest a locking pin mechanism including a shoulderless pin, wherein the cross-sectional area of the first and second channels are different as recited in claim 16. Applicants request that the rejection of claim 16 be withdrawn. As claims 17 and 18 depend from claim 16, these claims are also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 16.

Conclusion

In light of the foregoing, Applicants submit that claims 1-3, 6, 9-12 and 16-18 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicants do not believe that any fee is due at this time. However, the Commissioner is authorized to charge any fee that may have been overlooked to Deposit Account No. 10-0223.

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